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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

-----)
In the Matter of the Application of)

HUGHES COMMUNICATIONS, INC.)

For Authority to Launch)
and Operate StarLynx™,)
a Global Mobile Satellite)
System)
-----)

File No:

APPLICATION

Pursant to Sections 308 and 309 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 308 and 309, Hughes Communications, Inc. (HCI), an indirect wholly-owned subsidiary of Hughes Electronics Corporation (HE), hereby requests authority to launch and operate a satellite system, known as StarLynx™, in both the geostationary orbit (GSO) and medium Earth orbit (MEO), to provide global wideband mobile and portable satellite communications services.

The StarLynx™ system offers a unique mix of services in a manner never proposed before. StarLynx™ offers two-way, broadband service to small user terminals for use in conjunction with personal computers and other electronic devices as well as to terminals that can be mounted on vehicles. The hybrid GSO/NGSO nature of the system facilitates co-frequency sharing with both GSO systems and other NGSO systems that are designed to share spectrum. StarLynx™, which offers Mobile Satellite Services (MSS) seamlessly integrated with Fixed

Satellite Services (FSS), is an innovative system that efficiently utilizes the available spectrum for a combination of mobile and portable uses.

The StarLynx™ system will be comprised of a total of four satellites at two GSO orbital positions and 20 satellites in medium Earth orbit. The system will contain radio communication links, intersatellite links, and telemetry, tracking, and command (TT&C) links. V-band communications will operate at 37.5-38.6 GHz for space-to-Earth transmissions and in 1.1 GHz of contiguous spectrum between 45.5-46.7 GHz for Earth-to-space transmissions. Optical (laser) intersatellite links operating in the 1.55 micron range will interconnect the satellites for global service.

EXECUTIVE SUMMARY

Hughes Communications, Inc. (HCI), an indirect wholly-owned subsidiary of Hughes Electronics Corporation (HE), hereby requests authority to launch and operate the StarLynx™ mobile satellite system to provide advanced mobile and portable wideband data communications services.

StarLynx™ will provide innovative, affordable, and convenient satellite communications services in the United States and throughout the world. Service to portable user terminals that are stationary when they transmit and receive will use a small, flat antenna (as small as 30 x 30 cm or 11.8 x 11.8 inches) and support data rates up to 2 Mbps. These antennas will be integrated with electronics and will work in conjunction with notebook and desktop computers, personal digital assistants, electronic planners, and other devices that would otherwise use a wired modem connection for data and voice communications. Service to mobile user terminals that transmit and receive while in motion will utilize somewhat larger (approximately 60 x 60 cm or 23.6 x 23.6 inches) antennas and will support data rates up to 8 Mbps. These conformal antennas will be mounted onto vehicles, including automobiles, trucks, trains, ships, and airplanes.

The system will serve the rapidly increasing number of people who require voice and high rate, interactive data services at any time at any location. Using either the portable or mobile devices, users will be able to stay connected to a wide variety of networks, including the Internet, wide and local area networks (WANs and LANs), remote computers, asynchronous transfer mode (ATM) networks, and the public switched telephone network (PSTN).

The satellites in the StarLynx™ system form a hybrid constellation with four GSO satellites (two satellites in each of two GSO orbital positions) and 20 satellites in a non-geostationary, medium Earth orbit (MEO). Demand for early service over the United States will be met initially by the GSO satellites. The MEO constellation will then be added to provide global coverage, increased elevation angles for users in higher latitudes, and additional satellites in view for satellite diversity and improved performance. The MEO constellation will consist of four planes with five satellites in each plane, inclined at 55 degrees with respect to the equator and in circular orbits at an altitude of 10,352 km.

Each satellite will incorporate spot beam antennas, a processor for switching traffic between beams, and intersatellite links (ISLs) to interconnect adjacent satellites. A signal received by one satellite can be relayed directly back to the same beam, switched to another beam, or relayed by intersatellite links to other satellites. Thus, StarLynx™ forms a global network for the transport of high data rate traffic.

The StarLynx™ system has been designed to facilitate frequency sharing with other systems, whether in GSO or NGSO orbits. Potential interference with other systems is mitigated using satellite diversity for MEO satellites and orbital separation for GSO satellites. The use of Code Division Multiple Access (CDMA) further enhances the sharing capability of this system.

The system will utilize V-band spectrum at 37.5-38.6 GHz for space-to-Earth transmissions and 1.1 GHz of contiguous spectrum between 45.5-46.7 GHz for Earth-to-space transmissions. Through the use of spot beam technology, dual polarization, and CDMA, the system will reuse this spectrum ten times per satellite.

StarLynx™ offers Mobile Satellite Services (MSS) that will be integrated with Fixed Satellite Services (FSS) to portable user terminals. By offering MSS in a manner that blends seamlessly with the provision of FSS in the same frequency band, StarLynx™ will be able to operate both in a part of the band that is allocated for the FSS, as well as a part of the band that is allocated for MSS, thereby combining capabilities in a way that expands the range of satellite services offered at V-band.

Grant of this application will promote the efficient and innovative use of the V-band spectrum, which has been unused by commercial satellites to date. The innovative StarLynx™ system will greatly improve mobile access to critical data for business and industry, extend the U.S. technological base and attendant high-technology jobs, and promote U.S. international trade.

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1. INTRODUCTION

1.1. GENERAL DESCRIPTION OF THE SYSTEM

StarLynx™ is a global mobile and portable satellite communications system providing wideband communications services to customers within the United States and throughout the world. The StarLynx™ system is an innovative, hybrid design, which provides both MSS (mobile) and FSS (portable) services utilizing GSO and MEO satellites operating in the same frequency bands. The system has been designed to facilitate frequency sharing with other NGSO and GSO systems.

StarLynx™ will serve the rapidly increasing number of people who require wideband, interactive data network and voice connections at any time and location. Utilizing small mobile or portable terminals, users will be able to conveniently connect to a variety of networks, including the Internet, wide area and local area networks, home and office computers, asynchronous transfer mode networks, and the public switched telephone network.

Both the GSO and MEO StarLynx™ satellites will provide V-band spot beam coverage that can be reconfigured on orbit. Use of spot beams, dual polarization, and CDMA allows the V-band spectrum to be reused ten times by each StarLynx™ satellite.

The ground segment will consist of user terminals, System Access Nodes, and Control Centers. There will be a family of StarLynx™ user terminals ranging in size from a 30 x 30 cm, flat portable antenna to a larger 60 x 60 cm, conformal, vehicle-mounted antenna. The antennas will be integrated with electronics, which will connect to computers, personal digital assistants, electronic planners, and other

devices that would otherwise have to use modems and PSTN connections for data and voice communications. An optional Global Positioning System (GPS) capability can be integrated into terminals to provide location-dependent information.

The system is designed to enable interactive wireless communications at data rates up to 8 Mbps. A broad range of applications ranging from voice to E1 (2 Mbps) web-browsing to high-speed data transfer will be available. Connection routing is accomplished with packet switching on the satellite for global mesh-connectivity.

System Access Nodes will provide users a transparent connection with various terrestrial networks. Control Centers consist of a Satellite Control Center and Network Operations Control Center. The StarLynx™ system is depicted in Figure 1.1-1, and the key features are shown in Figure 1.1-2.

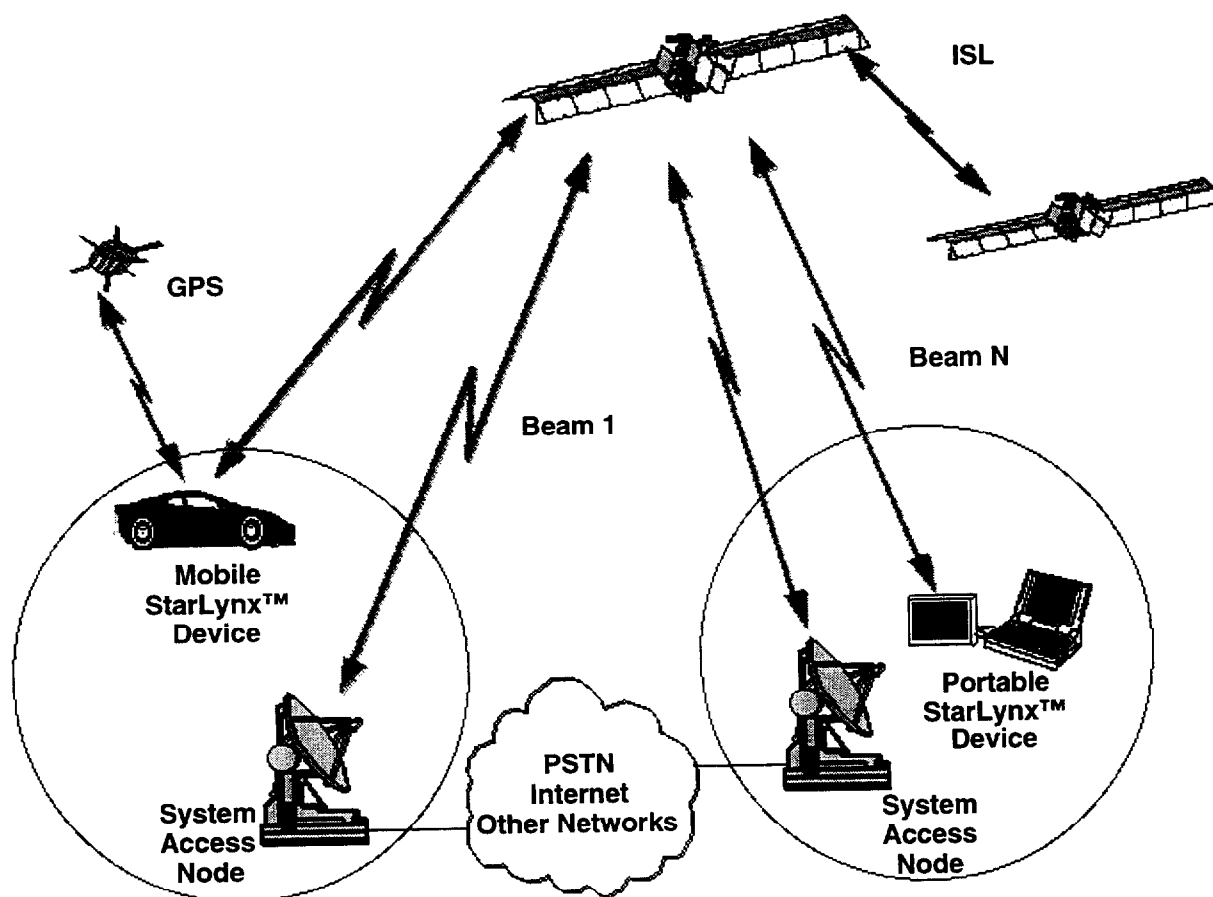


Figure 1.1-1. The StarLynx™ System

- Mobile and Portable Service to Small Terminals
- Variable Data Rate Capability (4 Kbps to 8 Mbps)
- Hybrid GSO/MEO Satellite Constellation
- 10 Times Spectrum Reuse per Satellite
- Selectable Coverage Area Provided by Narrow Spot Beams
- Satellite Processor
- Laser Intersatellite Links

Figure 1.1-2. Key Features

1.2. POINTS OF CONTACT FOR APPLICANT

1.2.1. Name, Address, and Phone Number of Applicant

Hughes Communications, Inc.
1500 Hughes Way
Long Beach, CA 90810
Attn: Jerald F. Farrell, President
(310) 525-5010
cc: Scott Tollefsen, Vice President, General Counsel & Secretary
(310) 525-5150

1.2.2. Name, Address, and Phone Number of Contact

Gary M. Epstein
John P. Janka
Arthur S. Landerholm
Latham & Watkins
1001 Pennsylvania Avenue, N.W., Suite 1300
Washington, DC 20004
(202) 637-2200

1.2.3. Type of Authorization Requested

HCI requests authority to launch and operate a total of four GSO satellites at two orbital positions and 20 MEO satellites. The GSO orbital positions for which HCI is requesting authority are 99°W and 101°W. The MEO satellites will be in circular orbit at an equatorial altitude of 10,352 km, with four planes and five satellites per plane inclined at 55 degrees with respect to the equator.

2. PUBLIC INTEREST CONSIDERATIONS

StarLynx™ will provide communications capabilities that will significantly contribute to the National Information Infrastructure (NII) and Global Information Infrastructure (GII) by making available high data rate, mobile and portable wideband communications on demand throughout the world. StarLynx™ will provide high speed access to the Internet in particular and multi-rate, multi-functional telecommunications services in general. The innovative design of the system ensures that this capability can be provided at low cost with a quick deployment time.

In response to the large increase in traffic on the PSTN created by Internet use, deployment of alternative paths for data traffic is a vital U.S. national interest, especially for users beyond the reach of conventional networks. StarLynx™ will create a novel mobile and portable data infrastructure that is otherwise not available and will support a wide range of voice, image, and data communications services.

The benefits of StarLynx™ to American commerce and industry are manifold. With its high data rate mobile telecommunications capability, StarLynx™ will support commercial communications ranging from high speed information transfers to interactive multimedia exchanges between businesses and customers currently unreachable by existing systems, thereby creating new efficiencies and productivity for mobile industries such as real estate, construction, media, and health services. This new capability will significantly expand the United States economy, as well as greatly increase the competitiveness of U.S. enterprise in the global economy.

Developing countries will be able to use StarLynx™ to improve their own national telecommunications infrastructures without the high costs and delay of installing towers, laying cable, and building terrestrial wireless facilities in all areas. StarLynx™ will also significantly expand connectivity for users in developed regions of the world.

Construction of the StarLynx™ system will in large part be accomplished by HE, an American telecommunications company. The space segment will consist of satellites that will be manufactured at the Hughes Space and Communications plant in El Segundo, California. Ground terminals will be manufactured by Hughes Network Systems of San Diego, California, and Germantown, Maryland, and other U.S. suppliers. The commitment by Hughes to use its U.S. manufacturing and construction facilities to build StarLynx™ will result in the creation of numerous highly skilled, professional jobs for Americans.

3. MARKET FOR SERVICES

3.1. OVERVIEW

The mobile and portable communications market is expanding at a rapidly increasing rate. This growth will support a much broader use of wireless services. Mobility is already a key feature in new computer and peripheral products and soon will be a basic requirement for these products.

A variety of mobile interactive information systems exist today, including dedicated mobile data networks, cellular, two-way paging, and other data systems. These current mobile systems provide voice, fax and data communications with data rates ranging from 4 kbps to 100 kbps. Wireless data services provide dispatch services, two-way paging, and network connections to meet business requirements. However, current services, including PCS, are limited in bandwidth and data rate capabilities and require extensive and costly infrastructure buildout. Moreover, in many cases, access to paging, cellular, PCS, and other mobile data services requires a separate device for each type of service, thereby posing a major disadvantage for users.

StarLynx™ will provide a wide range of high data rate communications services to mobile and portable users. No current or announced system, terrestrial or satellite, provides all the capabilities that StarLynx™ offers. StarLynx™ meets the needs of the new business professionals who are dependent on immediate access to up-to-the-minute data wherever their locations.

Wiring the globe for high data rate wireless mobile and portable terrestrial communications would cost trillions of U.S. dollars and take decades. In contrast,

the rapidly deployable StarLynx™ network can provide universal availability of these high data rate mobile and portable services sooner and at a lower cost than any global terrestrial network.

3.2. MARKET DEMAND

Growth projections of portable computing device users forecast that by the year 2000, one out of every two workers will use such portable devices (Figure 3.2-1). These portable devices, including laptop and palmtop computers, personal digital assistants, smart phones, and network computers, have projected compound annual growth rates greater than 75%.

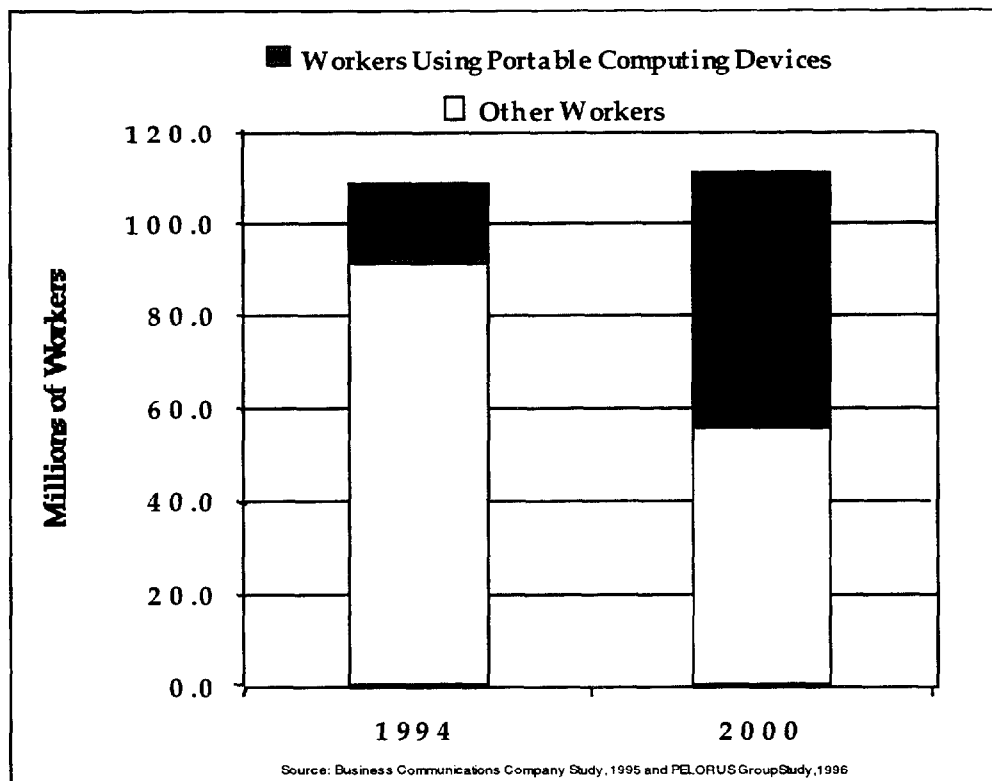


Figure 3.2-1. Growth in the U.S. Workforce Using Portable Devices

By the year 2000, approximately one fifth of the world's population will have access to wireless services, voice, and data. It is estimated that 25% of those who have wireless access will use it for data applications. The market demand for